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3,323,215

ARTICULATED SIGHT

Filed Sept. 25, 1964

2 Sheets-Sheet 1

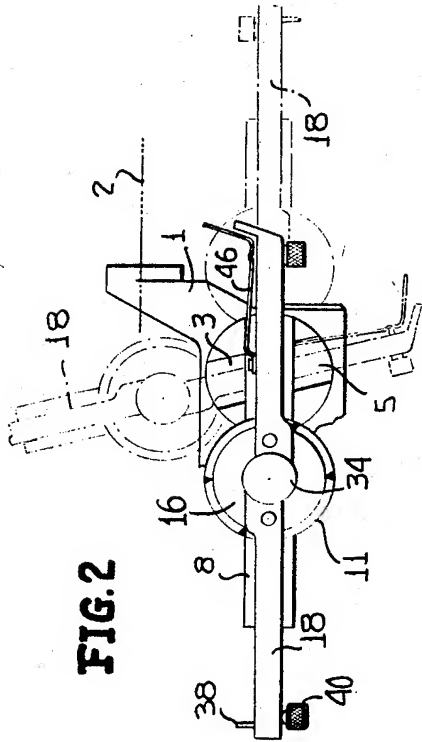


FIG. 2

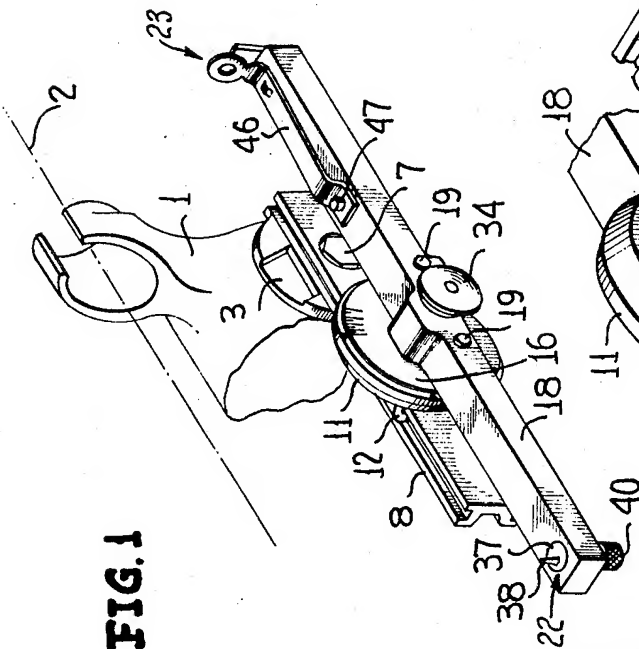


FIG. 1

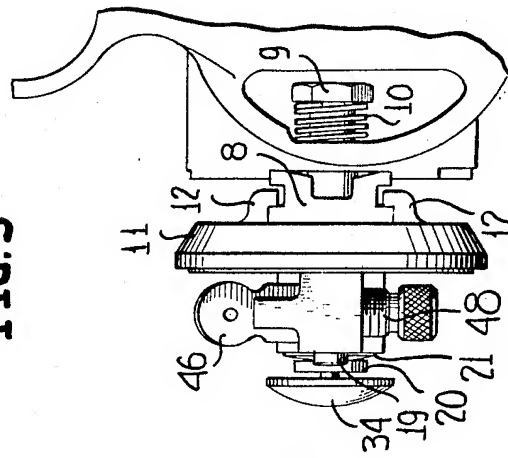


FIG. 3

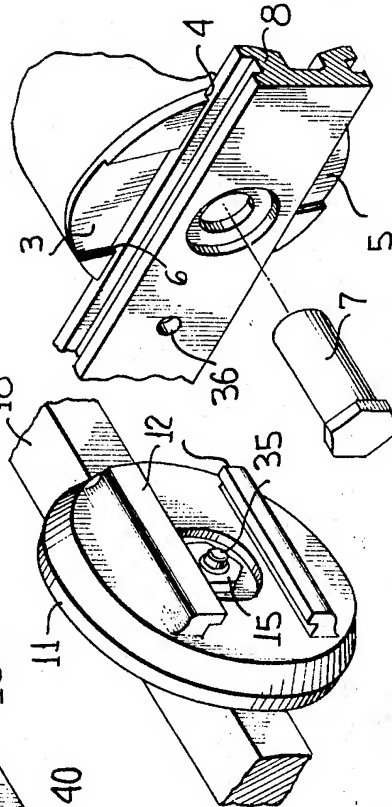


FIG. 4

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1416

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2 Sheets-Sheet 2

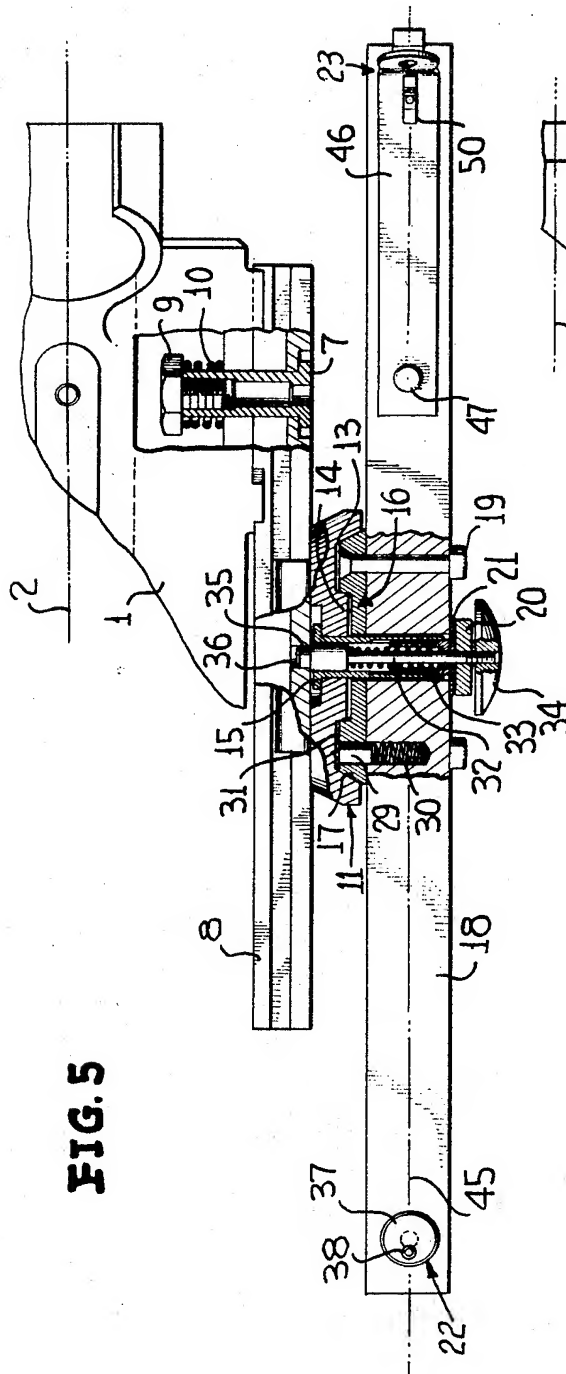


FIG. 5

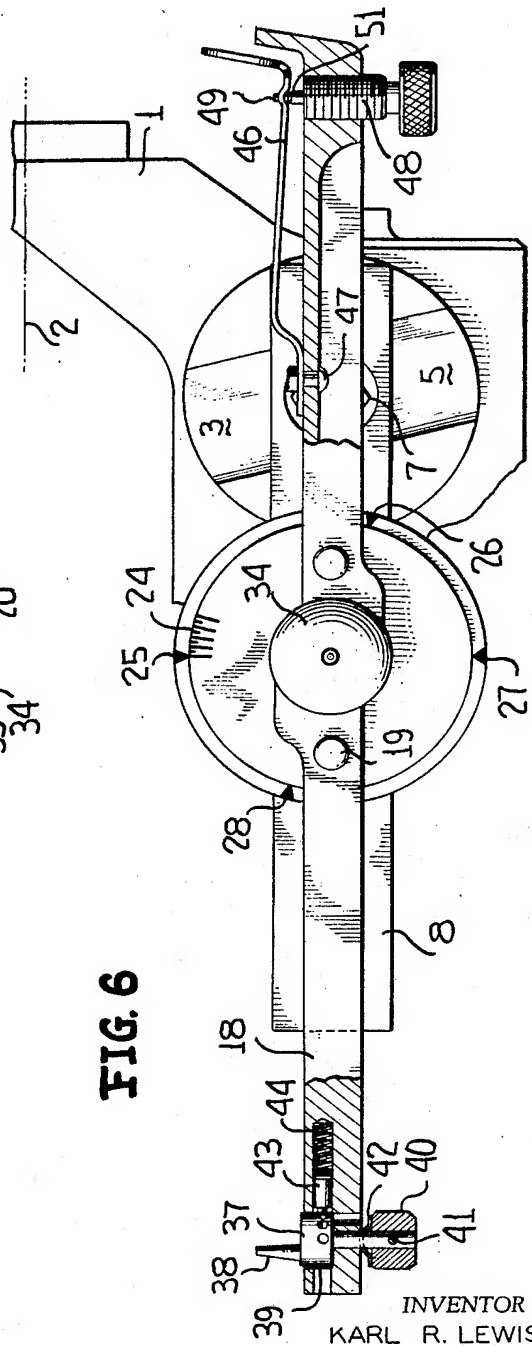


FIG. 6

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3,323,215

ARTICULATED SIGHT

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12 Claims. (Cl. 33—53)

This invention pertains to a sight for a firearm, and more particularly to an articulated, adjustable sight accommodating a variety of possible positions assumed by an operator with respect to the firearm.

Certain types of firearms, such as for example rifles, are relatively flat shooting. With such firearms, the bore through which the projectile passes is substantially parallel to the line of sight or sight pattern. With other types of firearms, such as for example mortars, the projectile follows an arched path and the bore through which the projectile passes often must be at a marked angle of incline to the line of sight. When such a firearm is discharged at an object near its extreme range, the angle of incline must approach 45°.

With this latter type of firearm, conventional sights mounted on the upper side of the firearm to position the line of sight substantially parallel to the bore center line are virtually useless, because they cannot be adjusted for the required range. Prior art sights for such arched projectile path weapons have typically been mounted on the side of the firearm, and require the operator of the firearm to assume a sighting position which would accommodate this placement of the sight. Such sights are not adjustable to permit accommodation of the sight to the operator of the weapon thereby presenting a severe handicap when the weapon operator must fire the weapon without exposing himself.

The sight of the present invention corrects this deficiency by permitting adjustment of an articulated sight to accommodate an individual weapon operator. Adjustments are provided which permit the weapon operator to adjust the sight to a preferred eye relief or vary the sight pattern placement relative to the bore centerline to accommodate varying positions.

It is, therefore, an object of this invention to provide an articulated sight which is adjustable to accommodate a variety of operator positions.

It is a further object of this invention to provide an improved sight for an arched projectile path weapon which is adjustable to accommodate the weapon operator's preference of eye relief or position while maintaining the required angle of incline between the line of sight and the weapon bore centerline.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application which will be indicated in the appended claims.

In the drawings:

FIGURE 1 is a perspective view of a portion of a weapon body and the articulated sight of the present invention;

FIGURE 2 is a side view of the articulated sight and weapon body, indicating various positions which the sight may take;

FIGURE 3 is an end view of the articulated sight and a portion of the weapon body;

FIGURE 4 is an exploded view of certain portions of the articulated sight;

FIGURE 5 is a top view, in partial section, of the articulated sight and a portion of the weapon body; and

FIGURE 6 is a side view, in partial section, showing certain details of the sight construction.

Briefly, the articulated sight of the present invention

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permits displacement of the sighting plane from the point of sight attachment to the weapon by varying distances and angles. This is accomplished by providing adjustment of a portion of the sight to varying angles relative to the weapon bore centerline and adjustment of other portions of the sight to varying distances from the point of sight attachment to the weapon. Thus, the articulation of this sight arises from the distinct adjustment of separate portions of the sight. Accordingly, a slide member is provided which may be selectively positioned at one of a number of angles to the bore centerline. Movable along the slide member is a sight base adapted to position a sight disc at varying distances from the bore centerline. Depending from the sight disc is an adjustable sight bar on which are located the front and rear sights used to define a sight pattern and to determine the line of sight for the weapon. A weapon operator may choose from the several angles for positioning the slide and the varying distances for positioning the base in order to accommodate any suitable position or desired eye relief.

Range adjustments are made by varying the angle of the sight bar and disc relative to the sight base and the bore centerline of the firearm. Initial adjustment, or zeroing, of the sight is made by windage correction of the front sight and elevation correction of the rear sight.

A more complete understanding of the invention will be gained from a description taken in conjunction with the figures. Referring particularly to FIG. 1 there is shown a portion of the body 1 of any suitable arched projectile path weapon, such as a grenade launcher or mortar having a bore centerline 2. The body 1 is provided with a plurality of channels formed at various selected angles to the bore centerline 2, four such channels, 3, 4, 5 and 6, being shown. Two of the channels (4 and 6) extend generally parallel to the bore centerline 2, while the outer channels (3 and 5) extend at an angle to the centerline. The centerlines of the various channels intersect at a single point.

Referring now to FIG. 4, a pivot bolt 7 passes through a sight slide member 8 and into the weapon body 1 with its axis perpendicular to the weapon bore centerline 2 and passing through the intersection point of the channel centerlines. As shown, the projecting end of the bolt 7 engages the sight slide member 8. Within the weapon body 1, the pivot bolt 7 is held in place by a nut 9, and the bolt and nut are together urged inwardly by a retaining spring 10. By the force of the retaining spring 10, the sight slide member 8, which is engaged by the pivot bolt 7, is similarly pulled against the weapon body 1, and thereby held in the correct position within any chosen one of the channels 3, 4, 5 or 6. The variation in angle of sight pattern displacement from the bore centerline 2 of the weapon, as shown in FIG. 2, is chosen by selectively placing the sight slide member 8 in one of the various channels.

As readily understood by a person skilled in the arts of weaponry, the channels of the preferred embodiment are only exemplary of the available means for positioning the slide member at various angles to the bore centerline, and other means may be used, so long as the required relationships between the range adjustment elements of the sight are retained. These relationships are explained more fully below.

In order to provide for variation in the distance of displacement of the sight plane from the bore centerline 2 of the weapon and to accommodate variations in eye relief, a sight base member 11 slidably engages the sight slide member 8 and may be positioned at varying distances along the slide from the pivot bolt 7. The sight slide member 8 has grooves extending along the surfaces perpendicular to the axis of the pivot bolt 7, and the sight base 11 is provided with projections or ears 12 which

enter into these grooves and restrain the base 11 to movement longitudinally of the slides 8.

As best shown in FIG. 5, the opposite side of the base 11 from ears 12 is provided with a conical friction surface 13 and a center boss 14 for purposes to be subsequently described. A friction bolt 15 extends from the side of the base adjacent the slide outwardly through the base. In order to provide range adjustment, a sight disc member 16 is mounted on the base 11 for rotation about the pivot point provided by the friction bolt 15. The disc 16 has a conical friction surface 17 which mates with and engages the conical friction surface 13 of the base 11. A sight bar member 18 is fixed to the disc 16, by rivets 19 or any other suitable fastening device. The sight bar 18 rotates with the disc 16 about the friction bolt 15, which extends through both the disc and the bar. At the outer end of the friction bolt 15 is a friction nut 20 and a Belleville washer or other suitable spring device 21. The nut 20 is adjusted to apply a radially inward force on the spring washer 21, which in turn presses the bar 18 and disc 16 inwardly. This inwardly directed force causes a frictional engagement of the conical friction surfaces 13, 17 which restrains rotation of the disc and bar. The central boss 14 and friction bolt 15, engaging the disc member 16, together prevent rotation of the disc about any axis other than that defined by the bolt.

The sight bar member 18 carries a front sight 22 and a rear sight 23 which together define the plane of sight for the weapon operator or the sight pattern which the operator must align with his target before discharging the weapon. As may be readily understood, the angle of incline of the sight plane or pattern to the bore centerline 2 is determinative of the impact distance, or range, of the projectile.

As an indication of the impact point of the projectile, the disc member 16 carries range graduation marks 24. A selected range graduation mark 24 may be aligned with any selected one of four index marks, 25, 26, 27, 28 spaced around the sight base member 11, for purposes to be made more clear subsequently. The choice of the correct range graduation mark in darkness or other difficult circumstances is facilitated by the use of a detent provided by a plunger 29 carried by the disc member 16 and urged by a detent spring 30 into engagement with indentations formed on the inner surface 31 of the sight base 11. The indentations are spaced to correspond to the graduation marks 24 as those marks are aligned with the index marks carried by the base member. The sight base member 11 is adjustable along the sight slide member 8 in order to accommodate an individual operator's preference for eye relief, or the distance between the operator's eye and the rear sight 23.

In order to prevent undesirable movement of the base of the slide, and to provide stability for the sight plane, locking means are provided to hold the base at any selected position along the slide, while permitting movement when the lock is released. The locking means includes a locking pin 32 which extends through the center of the friction bolt 15. A locking pin spring 33, within the friction bolt, engages a shoulder of the pin and resiliently urges the pin toward the sight slide member 8. At the outer end of the locking pin 32 is a locking projection 35. Spaced along the sight slide member 8 are a number of adjustment holes 36, which may be engaged by the locking projection 35 to hold the sight base member 11 at any selected position. To permit movement of the sight base member 11 between the various possible positions, the locking projection 35 is withdrawn by pulling the locking pin release button 34 outwardly against the force of spring 33.

As readily understood, the groove and ear portions which restrain the base member to longitudinal movement along the slide member and the locking pin which holds the base in a selected position are the means chosen to perform those functions in the preferred embodiment

of this invention, but are not the only means which may be chosen. Others will be apparent to persons skilled in the art.

In order to provide for initial zero adjustment of the front and rear sight to the weapon, the front sight is adjustable for windage, or horizontal correction, while the rear sight is adjustable for elevation, or vertical, correction. The front sight is formed by a headed cylindrical member 37 which has a projection 38 on its upper surface. As may be most clearly seen from FIG. 5 the projection 38 is on an axis eccentrically displaced from the central axis of the headed member 37. The headed member 37 is mounted within a countersunk bore 39 through the forward end of the sight bar member 18. The lower end of the member 37 is engaged by an adjusting knob 40 fixed to the member 37 by any suitable means such as a roll pin 41. Between the knob 40 and the lower surface of the sight bar member 18 is a spring member 42 which provides a resilient downward force to hold the member 37 in place. A detent means, provided by the detent pin 43 and a detent spring 44, holds the headed member 37 in any selected rotary position relative to the sight bar member 18. To adjust for windage correction, the adjusting knob 40 is rotated, causing a lateral displacement of the eccentric sight projection 38 from the centerline 45 of the sight bar member 18.

The rear sight, used to define the sight plane or pattern, is provided by a member 46, formed from spring stock, and attached at its forward end to sight bar member 18 by any suitable means, such as a rivet 47. A threaded elevation screw 48 engages a threaded opening through the sight bar member 18, along a substantially vertical axis. The upper end of the elevation screw 48 is provided with a pin member 49 which extends through a longitudinally directed opening 50 in the sight member 46. The pin 49 has a shoulder 51 on which the sight member 46 rests. As may be understood, rotation of the elevation screw 48 will raise or lower the shoulder 51 relative to the upper surface of the sight bar member 18, and thus provide a correction for elevation setting. Further, the use of the pin 49 which protrudes through the opening 50 provides an additional advantage in that lateral or sideways offsetting of the rear sight is impossible and the sight setting, once chosen, is thus preserved free from accidental error.

In operation, an operator of the weapon to which the sight of this invention is attached may select from a very large number of possible positions for the sight elements, while maintaining a sight pattern or plane which will result in accurate placement of a projectile on the selected target. By positioning the sight slide member 8 in various of the channels 3, 4, 5, or 6, the operator determines the general angle of displacement of the sight plane from the bore centerline 2 of the weapon. For instance, should the operator desire to position the plane of sight substantially below the bore centerline 2 to prevent unnecessary exposure when firing from a concealed position such as a foxhole, he positions the sight slide member 8 over the channel 4 which is directed generally downwardly from the bore centerline. The operator then adjusts the distance of displacement of the sight plane from the bore centerline 2 by selecting a position for the sight base member 11 along the sight slide member 8 which provides his preferred eye relief. Finally, the graduation marks 24 on the sight disc member 16 are indexed against the index mark which is correctly positioned for the chosen channel. For example, with the sight slide member 8 positioned in channel 4, index mark 26 provides correct ranging. Assuming that the sight has previously been properly zeroed for this particular weapon, a selection of impact range is then made by setting the graduation marks against the index mark. In the embodiment illustrated, alternate channels are substantially aligned. This provides an exceptionally long scale adjust-

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ment for eye relief, or the distance between the operator's eye and the rear sight. For example, the sight slide member 8 may be positioned in either channel 3 or channel 5 and adjustment of the sight base member 11 would be along a substantially straight line equal to nearly twice the length of the sight slide member 8. Thus, the eye relief can be varied over a quite extensive range in order to accommodate the personal preference of the weapon operator.

Before the sight is to be used with the weapon in the field, the front and rear sights must be adjusted to zero the weapon. Once the placement of projectiles on target is obtained by windage and elevation corrections of the front and rear sights, respectively, no further adjustment of these sights is necessary for range variation. Such range variation is accommodated by the adjustment of the sight bar and disc relative to the sight base member 11, as indicated by the graduation marks 24.

As will be apparent to persons skilled in the art, various modifications and adaptations of the structure above described will become readily apparent without departure from the spirit and scope of the invention, the scope of which is defined in the appended claims.

I claim:

1. An articulated sight for a firearm having a bore comprising:
 - a longitudinally extended first member,
 - means for positioning the first member at a selected one of various angles to the bore centerline,
 - a second member engaging said first member,
 - means for restraining the second member to movement longitudinally of the first member,
 - means for holding the second member at a selected position along the first member,
 - a third member engaging said second member,
 - means mounting the third member for rotation relative to the second member for range adjustment, and
 - spaced sights carried by said third member for defining a sight pattern.
2. An articulated sight as in claim 1, in which:
 - said means for positioning the first member comprises a plurality of channels on the firearm at various angles to the bore centerline, and
 - means for resiliently urging the first member into any selected one of the channels.
3. An articulated sight as in claim 1, in which:
 - said means for restraining the second member comprises:
 - longitudinal grooves on the first member, and
 - ears on the second member engaging the grooves.
4. An articulated sight as in claim 1, in which said means for holding the second member comprises
 - a locking pin carried by the second member,
 - means for urging the locking pin toward the first member, and
 - means on the first member for receiving the locking pin.
5. An articulated sight as in claim 1 in which:
 - said means mounting the third member for rotation comprises
 - a bolt extending through both the second and third members to define an axis of rotation.
6. An articulated sight as in claim 1, in which
 - said sights comprise a front sight and a rear sight, and
 - means for adjusting the front sight for windage correction.

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7. An articulated sight as in claim 1, in which said sights comprise a front sight and a rear sight, and means for adjusting the rear sight for elevation correction.
8. An articulated sight for a firearm having a bore comprising:
 - a sight slide,
 - a plurality of channels on the firearm at various angles to the bore centerline,
 - means for resiliently urging the slide into any selected one of the channels,
 - a sight base engaging the slide,
 - grooves on the slide,
 - ears on the base,
 - the ears engaging the grooves to restrain the base to movement longitudinally of the slide,
 - a locking pin carried by the base,
 - means for urging the pin toward the slide,
 - means spaced along the slide for receiving the pin to hold the base at any selected position along the slide,
 - a sight disc engaging the base,
 - a bolt extending through the disc and base to define an axis of relative rotation for the disc and base,
 - a sight bar engaging the disc, and
 - spaced front and rear sights on the bar.
9. An articulated sight as in claim 8 further comprising:
 - detent means on the sight disc engaging the sight base to permit relative rotation between the two over discrete increments.
10. An articulated sight as in claim 8 further comprising:
 - a front sight member
 - means for mounting the front sight member on the bar for rotation about a substantially vertical axis,
 - a projection on the upper surface of the front sight members eccentric of the rotational axis, and
 - means for rotating the front sight member to cause lateral displacement of the projection from the longitudinal axis of the sight bar.
11. An articulated sight as in claim 10 further comprising:
 - detent means on the sight bar engaging the front sight member to permit rotation of that member over discrete increments.
12. An articulated sight as in claim 8 further comprising:
 - a rear sight member,
 - a threaded element engaging the sight bar and having a projection of reduced diameter at its upper extremity,
 - the projection engaging the rear sight member to restrain that member from lateral movement.

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